

CLAIMS

1. A gate valve, comprising:

a polymeric monolithic liner defining a valve element cavity, said liner having a first side, a second side, a first cylindrical flange portion projecting outwardly from said first side, and a second cylindrical flange portion projecting outwardly from said second side, said first and second cylindrical flange portions defining a fluid passageway through said liner transverse to said valve element cavity;

a first housing portion having a first front face, a first back face, and a first throughbore for receiving said first annular flange portion;

a second housing portion having a second front face, a second back face, and a second throughbore for receiving said second annular flange portion, a liner cavity being formed between the back faces of said first and second housing portions;

a first face ring, said first face ring including a first cylindrical tubular portion and a first radially outwardly projecting, annularly extending face ring flange, said first tubular portion being received in said first annular flange portion;

a second face ring, said second face ring including a second cylindrical tubular portion and a second radially outwardly projecting, annularly extending face ring flange, said second tubular portion being received in said second annular flange portion; and

a gate valve element slidably received in said valve element cavity.

2. The gate valve of Claim 1 wherein said liner has a first radially inwardly projecting, annularly extending lip formed in said first annular flange portion and a second radially inwardly projecting, annularly extending lip in said second annular flange portion, said first tubular portion of said first face ring having an axially innermost end, said axially innermost end of said first face ring abutting said first lip, said second tubular portion of said second face ring having an axially innermost end, said axially innermost end of said second face ring abutting said second lip.

3. The gate valve of Claim 2 wherein said first housing portion has a first annular recess in said first front face in surrounding relationship to said first throughbore, said first face ring flange being received in said first recess and said second housing portion has a second annular recess in said second front face in surrounding relationship

to said second throughbore, said second face ring flange being received in said second recess.

4. The gate valve of Claim 1 wherein said liner has an upper open end forming an entrance into said valve element cavity, said upper open end of said liner
5 defining a seal pocket and there is an elastomeric seal received in said seal pocket in surrounding relationship to said valve element.

5. The gate valve of Claim 1 including a connector assembly connecting said first and second housing portions together.

6. The gate valve of Claim 5 wherein said connector assembly includes
10 compressive fasteners urging said first and second housing portions toward one another.

7. The gate valve of Claim 4, further including a yoke adapter, said yoke adapter having a body forming a top surface and a bottom surface, a slot extending through said top and bottom surfaces, said yoke adapter being secured to said housing portions, said bottom surface of said body overlying said seal pocket.

8. The gate valve of Claim 7 wherein said bottom surface of said body of
15 said yoke adapter is compressively urged against said elastomeric seal.

9. The gate valve of Claim 7 wherein said top surface of said body forms a mounting surface and there is a yoke secured to said mounting surface.

10. The gate valve of Claim 1 wherein there is a first annular elastomeric seal
20 ring disposed between said first face ring and said first annular flange portion on said liner and a second annular elastomeric seal ring disposed between said second face ring and said second annular flange portion on said liner.

11. The gate valve of Claim 2 wherein said first lip is formed adjacent said valve element cavity and said second lip is formed adjacent said valve element cavity.

FOUO 4475-082901

12. The gate valve of Claim 3 wherein said first and second recesses have a depth that is less than the axial thickness of said first and second face ring flanges.

13. A method of forming a liner for a gate valve comprising:

5 providing a mold having first and second mold halves, said first and second mold halves defining a liner cavity, at least one of said first and second mold halves having an injection port for injection of a polymeric material;

10 disposing a dummy gate valve element in said cavity, said dummy gate valve element having a first side, a second side, and at least one positioning hole through said first and second sides and a passageway through said first and second sides, said first and second mold halves each having at least one positioning bore;

disposing a first positioning pin in said at least one positioning bore in said first mold half, said first positioning pin having a first axially extending projection received in said at least one positioning hole and a first annular shoulder abutting said first side of said dummy gate valve element;

15 disposing a second positioning pin in said at least one positioning bore in said second mold half, said second positioning pin having a first axially extending projection received in said at least one positioning hole and an annular shoulder abutting said second side of said dummy gate valve element, said first and second positioning pins being compressively urged toward one another to hold said dummy gate valve element in a predetermined position in said cavity whereby said passageway in said dummy gate valve element is in register with said injection port in said at least one of said first and second mold halves;

injecting a polymeric material into said cavity through said injection port;

allowing said polymeric material to set to form a liner blank;

25 removing said first and second positioning pins;

disassembling said mold halves;

removing said liner blank; and

forming a flowpath through said liner blank.

094475-082901
FOUO 2005-04-14